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Human Performance Lab Newsletter, March 2006

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Human Performance Lab News & Views

Department of Health, Physical Education, Recreation and Sport Science

MARCH 2006

KELLY'S CORNER

- DAVE BACHARACH

Annual greetings to everyone. I found myself traveling more this fall and winter than ever before. In part it is because I was coaching alpine skiing, but that's not the only reason. My parents and in-laws are getting older and I feel a stronger desire to visit them more. So, throughout the year we have driven more. As we did however, I couldn't help but notice how many cars and trucks cruised along with just one person. With gas prices fluctuating from \$2.00 to \$3.50, it was a strain for me to understand why people seemed to be "just out driving around". Did they all have such a noble purpose as we? Then I asked myself the question, "What kinds of gas prices would it take for people to start changing their driving habits?"

Well the world wide web had the answer, but I was very surprised to find how little influence gas prices have on people's thinking. For example, the 2005 GfK NOP Green Gauge Study revealed that at \$3.00/gal, only 1/3 of all drivers would consider switching to their most fuel efficient vehicle or reduce their overall driving. Less than a 1/4 would consider alternative forms of transportation such as walking, biking or car pooling and a mere 1/6 would use public transportation. It isn't until prices go over \$4.00/gal that just about 1/2 the drivers polled would either drive or look to purchase a more fuel efficient vehicle, reduce overall driving, use carpools and/or alternative forms of transportation. Finally at the \$5.00/gal mark, 2/3 of drivers would employ at least one of these options: purchasing a more fuel efficient vehicle, carpooling, reducing overall driving, or walk or bike. Even at \$5.00/gal, just over half were willing to use public transportation.

When the rest of the world and many of our big cities depend on public transportation, why is that so few people would consider it as a viable cost/energy savings option? There is a certain argument that would suggest the inconvenience of time schedules and/or lack of proximity to desired destination are not worth the cost savings, but perhaps we ought to look for and support public transportation whenever we can. I or perhaps I should say we faculty in the HPL actually enjoy finding public transportation options when we travel. Almost every major airport in the U.S. is well serviced by public buses or trains. For \$1-2 you can reach a downtown destination or hotel complex that might otherwise have cost \$10-15. Perhaps it is a bit more difficult hauling a suitcase onto a bus, but the more we support public transportation, the more viable it will become. There are also many untold benefits to such small inconveniences. You are doing a little strength training by lifting your bags yourself, and you typically have to walk a little farther to catch the bus versus flagging down a taxi. One has to remember, it's the little things we do in life that add up to make us who we really are. So as always, let's take care of ourselves, live the best we can, be active and encourage others to do the same.

*"Success usually comes
to those who are too busy
to be looking for it"*

-Henry David Thoreau

"Come on in, the water's great"

- Kirk Lewis, M.S.

Land exercise offers tremendous benefits, but too often aches, pains, overheating, sweating, and feelings of exhaustion accompany those benefits. Water allows us to achieve our fitness goals without experiencing all the possible negative side effects. Furthermore, exercising in the water helps eliminate feelings of self-consciousness because no one can see what you're doing! You don't have to fear that you won't succeed or that others will be watching you. Certain physical properties of water such as, buoyancy, viscosity, hydrostatic pressure, and specific heat make water an ideal medium for exercise.

BUOYANCY: While submerged to shoulder depth in the water, you experience an apparent weight loss of 90%. This means that if you weigh 200 lbs you will exercise at approximately 20 lbs while in the water. This apparent weight loss, due to buoyancy, dramatically decreases the stress on the weight-bearing joints (ankles, hips, and knees). The buoyancy of the water allows you to move around without getting hurt. You are able to work out with as much vigor as you want without the jarring impact associated with land exercise. Buoyancy is especially important in rehab situations and with special needs populations. Someone who may be unable to walk on land may be able to do so while in the water.

VISCOSITY: Because water is more viscous (thicker) than air, there is resistance to most movement in water. Therefore, while exercising in water, you would have more resistance than you would while exercising on land.

-Continued on page 3



NEW FACES IN THE LAB

David Keizer (back left) is from Saint Michael, MN. He graduated in 2002 from St. Cloud State University with degrees in health education & physical education. Upon completion of his master's degree from SCSU he plans to attend medical school or pursue a PhD in cell physiology. He enjoys playing guitar, writing music, and anything to do with sports and fitness. David's favorite candy is Swedish Fish.

Katie Snodgrass (front left) is originally from Minneapolis, MN. She received her undergraduate degree in dietetics from the College of St. Benedict in St. Joseph, MN. She currently works as a Nutrition Educator for the Stearns County Public Health Department, while pursuing her master's degree in cardiac rehabilitation. She hopes to use her education in nutrition and exercise science to work with cardiac patients in a clinical or hospital setting.

"A pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty"

-Sir Winston Churchill

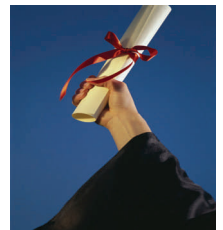
Nathan Hendrickson (back right) grew up in Prescott, WI, and attended college at the University of Wisconsin-River Falls. He graduated with a B.S.E. in health and human performance studies. Nate enjoys athletics, hunting, and walking his dog.



Kate Barnett (front right) is a first year graduate student in exercise physiology from Burnsville, MN. She graduated from St. Olaf College in 2005 with a B.A. degree in exercise science. She is interested in every sport, especially ice hockey and hopes to coach some day.

CONGRATULATIONS!!

The faculty and staff at the Human Performance Laboratory would like to acknowledge and congratulate Kristi Chupurdia, Jill French, Al Kraft, Sarah Nardi, and Jixiang Zheng who completed their thesis work and earned a Master of Science degree in 2005.



MUSCLE SORENESS-KATE BARNETT

It seems that one of the most common resolutions of the New Year is to lose weight or to exercise more often. Although many people start their new exercise programs very enthusiastically, people drop off as time goes on. One of the reasons that some may be deterred from their work-out programs is the muscle soreness that often results.

Pain often appears about one to two days after the initial exercise of the muscles and may last for up to six weeks. This discomfort is sometimes referred to as delayed onset muscle soreness (DOMS). The exact reason for this pain is unknown, but there are several factors that seem to contribute. Small tears

may occur in the muscle tissues, which release chemical substances that stimulate free nerve endings. Spasms or cramps, over-stretching and or tearing of the muscle surface, osmotic pressure changes that cause fluid retention in surrounding tissues (swelling), and other inflammatory responses all play a part in the discomfort.

It is often the first bout of repetitive, unaccustomed physical exercise that disrupts the integrity of the cells. If this damage becomes extensive, pain will result. The greatest post-exercise damage has been found to occur after high-force eccentric muscle actions. (Eccentric actions are the active resis-

tance of muscle lengthening, which occurs in downhill running, or slowly lowering a weight). This is because rapid, high-force eccentric actions place greater strain on connective tissues and muscle fibers when compared to concentric contractions.

Some studies have found that vitamin E supplementation prior to heavy resistance minimizes damage to muscle fiber membranes. It has also been found that building a base of strength through concentric exercises prior to eccentric exercises results in less damage and, therefore, less pain. So, take it slow and keep true to those resolutions!



Making sense of the numbers: Blood Pressure -Patty DeClercq

It is estimated that one in every four American adults has high blood pressure. Often times there are no signs or symptoms, which makes having high blood pressure especially dangerous. Regardless of race, age, or gender, anyone can develop high blood pressure. High blood pressure increases the risk of getting heart disease and/or kidney disease, and having a stroke.

Eating a healthy diet and exercising regularly will decrease the risk of having high blood pressure. A key to a healthy diet is choosing one low in sodium. The current

recommendation is to consume less than 2,400 mg of sodium per day. However, recent research shows that a diet consisting of less than 1,500 mg of sodium has much greater blood pressure lowering effects.

Being physically active is one of the most important steps you can take to prevent or control high blood pressure. All you need is 30 minutes of moderate-level physical activity on most days of the week. Examples of such activities are brisk walking, bicycling, raking leaves, and gardening.

The following table categorizes blood pressure into three groups. It is important to have blood pressure checked at a minimum of one time per year, however, those individuals that have borderline high or high blood pressure should have it checked more often.

Normal	Below 120/80
Pre-Hypertension	120/80 - 139/89
Hypertension	
Stage 1	140/90 - 159/99
Stage 2	160/100 and above

Women and Heart Disease– Katie Snodgrass

Statistics show that men are more likely than women to be diagnosed with heart disease. But does this mean that men are more likely to have heart disease than women? Not necessarily. New evidence suggests that men are just more likely to be diagnosed due to the focus of our health care system. According to an American Heart Association survey, less than half of all women reported that their doctors have discussed heart disease with them. As a result, many women underestimate their risks, and may be risking a cardiac related event.

Fact: More women than men die of heart disease in America. It is the #1 killer of women in our country. This should come

as no surprise since about 40% of all American women get no leisure time physical activity, and 33% are obese. These are two major risk factors for heart disease. Other risk factors include smoking, high blood pressure, high blood cholesterol, and high blood glucose.

Women need to be educated about their risks and initiate conversations with their health care providers about screening, detection and intervention. To get started, women can:

- Make a date with their health care provider.
- Exercise on a regular basis.
- Eat a healthy diet that is low in saturated fat and high in fruits, vegetables, and whole grains.

-Reduce excess pounds—a weight loss of as little as 5% of body weight can help improve health risks.

-If you smoke, quit! Talk to your health care provider and/or your health insurance carrier to help you make a plan for quitting.

For more information, check out Go Red for Women, the American Heart Association's campaign for women's heart disease awareness, www.americanheart.org/red.

"COME ON IN" CONTINUED FROM PAGE 1

This added resistance, that comes from all directions, may be just what you needed to spice up your current workout.

HYDROSTATIC PRESSURE: Hydrostatic pressure is the pressure you feel in your ears when you swim to the bottom of a pool and is thought to take stress off the heart by causing a "facilitated venous return". Simply stated, while standing the pressure from the water squeezes the legs and helps push blood back to the heart. Some researchers believe that this pressure helps fill the heart and enables it to pump more blood. Hydrostatic pressure is also thought to be beneficial to achy or sore joints, by giving them a gentle massage while submerged in the water.

SPECIFIC HEAT: Water tends to be less thermally stressful than land exercise because the rate of heat loss while in water is much greater than the rate of

heat loss to air. For example: you would get colder standing in 75°F water than you would standing on land at the same temperature. As a result of water's elevated specific heat (4 times greater than air), heat is dissipated more easily so the body doesn't have to work as hard to cool itself off. This is why competitive swimmers prefer cooler water. They don't have to waste energy cooling their bodies off; the water does it for them! This heat transfer does have limits. In water greater than 98°F, the specific heat is not great enough to cool the body effectively, and overheating may occur. Conversely, while in cold water less than 75°F, too much heat is drawn from the body causing it to shiver, increasing oxygen (energy) demand. But in a normal range, water exercise is fantastic.

Kirk Lewis is a 1998 graduate of the Exercise Physiology program. He is employed by the City of Becker as their Community Center's Fitness/Aquatics Director and is working on his EdD. at the University of St. Thomas.



If you are an HPL alumni and would like to submit an article next year, please contact Barb Kunze @ 320-308-3105 or brkunze@stcloudstate.edu



"HIS GARDEN GROWS"

-Exercise: A Guide from the National Institute on Aging.

<http://www.nih.gov/nia>



"My exercise focus is on gardening," Arthur Canfield, 83, of Fairfax, Virginia, told us. "I hate the thought of exercise for exercise's sake. I've never done that," he said. Mr. Canfield grew up close to the soil. He remembers driving horses pulling hay, sometimes all day, and carrying water down to the garden on his uncle's farm. His wife grew up in a family that made its living in the wholesale florist trade, so she too, understood gardens.

Mr. Canfield and his wife brought their lifelong affinity for gardening with them into their marriage. When they settled in Fairfax, near Mr. Canfield's job as an economist, the house they bought had about an acre of land, and they worked it - and worked it. "I didn't want to be deskbound when I became a bureaucrat. That's when I decided to become a serious gardener," he said. Gardening, Mr. Canfield told us, gives you an opportunity to exercise every part of your body and get satisfaction out of it at the same time. He said that gardening does more than build muscle and endurance. "You have to keep your balance. You're reaching up to prune trees, bending over to check your tomato plants. The actual energy output at any given moment may not amount to much, but your whole system is participating the whole time," he said. "It adds up."

Mr. Canfield lives on his own and drives himself wherever he needs to go. He works in his garden 3 or 4 hours every day. "It's got to be fun," he said. "I like to work what I do into a rhythmic pattern. Splitting wood, chopping down trees - the rhythmic pattern of exercise is like music. You're absolutely a free spirit. You forget about it as you're doing it." Mr. Canfield thinks that the idea of exercise sounds grim to most people - as though they have to do it, because there will be penalties if they don't. "But raking leaves is not something you should dread, it's a joyous thing. In New England, it's as much of an event as sugaring-off the maples; it's the center of things for a while," he said. He wants to give other older adults the following message about increasing their physical activity: "Once they start, they'll see that it builds on itself. It feels so good."

I ran across this article and thought some of you might appreciate the message; that fitness does not mean having to grind it out in the gym. In fact, many of the fittest and healthiest people are those that never step foot in a gym. For them, fitness is not a chore but a glorious way of life as they pursue their passions. In reading this story, I fondly reflected on my 90 year old Uncle John, who like Mr. Canfield, is an avid outdoors person. While age has slowed my uncle down, he remains an active gardener, beekeeper, hiker and hunter in the heart of the Allegheny National Forest in north-western Pennsylvania. —Glenn Street

WEIGHT LOSS AND SUPPLEMENTS— JAMES BURCKHARD

It's hard to keep up with all the fad diets and supplements on the market today. One of the more recent ones is Cortislim®. Under stress of any kind, a hormone called cortisol is secreted. This hormone will result in the breaking down of fat, protein and carbohydrates for energy. This increased availability of energy is the body's way of helping recover from bouts of physical activity. Cortisol also works inversely with insulin. If stress levels are high, cortisol will be elevated. At the same time, insulin levels will be low, keeping blood glucose available for the brain. With higher blood glucose levels, the available energy is not needed. With no need for the mobilized fat and carbohydrates, they will be restored as fat, adding to the risk of becoming overweight. Cortislim® claims to inhibit the release of cortisol and the storage of excess calories as fat.

Before purchasing or ingesting any kind of supplement, there are a few things you should know. In 1994 the FDA stopped regulating supplements. This means that they are self regulated. With no rules governing the supplement industry, companies can market a product with no guarantee of its ingredients. They do not have to tell you how much of each ingredient is actually in a product. This is very disturbing since it can make taking supplements quite risky.

Cortislim® ingredients are mainly tree barks and peels. Often doing little research before hand, many companies just combine ingredients from rare plants and make a supplement with the hopes of making money. Since there is no regulation on supplements, they may contain ingredients that have been shown to cause illness and/or

birth defects.

A better choice for losing extra fat is to exercise for longer than 45 minutes at low to moderate intensities. This will naturally increase your body's mechanisms for fat utilization. If you really want to lose weight, be active and take in slightly fewer calories than you expend each day. There are 3,500 calories in a pound of fat. Combine activity and diet for 500 less calories per day and you will lose one pound of fat per week. If you need help figuring out the number of calories you expend each day, check the world wide web or contact any of us at the HPL.



This past research year has been good to us again. We secured numerous grants from familiar companies and have uncovered some surprising results. The year started off on the right foot with a grant from Pacific Health Laboratories. In a study that has been gaining a lot of press, we investigated the fluid retention properties of different sports drinks following exercise-induced dehydration. Subjects lost about 2% of their body weight and then rested for three hours while rehydrating with one of three experimental beverages. Results indicate that when subjects ingested plain water, only about 50% of ingested fluid was retained. You can do better by drinking a traditional sports drink of carbohydrates

and electrolytes. Subjects retained about 75% of the fluid after three hours. The best treatment, however, was a sports drink with a small amount of protein added. This treatment resulted in retention of nearly 90% of fluid. It appears that ingesting plain water leads to rapid dilution of body fluids and increased urine output, whereas the two sports drinks maintained the concentration of body fluids at higher levels than water. When a small amount of protein is added to a sports drink, there is the additive effect of the protein to attract and hold on to water. The bottom line is that a properly formulated sports drink leads to greater retention and faster rehydration.

WEIGHT LOSS HINTS-JOE HARMON

Often times when something is repeated enough, no matter how false or incorrect it may be, it starts to become accepted as truth or fact. This phenomenon has become especially prevalent in the weight loss industry. Advertisements promise miracle pills or astonishing weight loss if only you buy this product, or that there is only one way to lose weight. With this in mind, here is a short list of some of the more common myths and/or misconceptions about weight loss today.

Lose 30 lbs. in 30 days- any diet making this claim isn't a healthy diet. It is bad for your body and the weight will come back after the 30 days.

Dieting means not eating- this isn't true at all. Starving deprives your body of nutrients it needs to function properly. The key is to make healthy eating choices, don't overindulge, and of course stay away from high fat fast food when possible.

You have to join a gym- exercising does not mean you have to be on a treadmill in a gym. Exercising can be walking your dog, playing with your kids in the yard, or gardening (see His Garden Grows, page 4)

A salad is always healthy- in general salads are good for you. However, when you see that person at the restau-

rant with a cup of bacon, cheese, salad dressing, and maybe some chicken or beef on top, a salad loses a lot of its health appeal.

The most important thing to remember is that weight loss is simple, but not easy (otherwise everyone would be thin). There isn't just one secret mix of dieting and exercise that will lead to weight loss. It is simply eating healthy and staying active, which of course is always easier said than done. But stay positive and motivated, and if you need any advice or guidance feel free to stop by the Human Performance Lab.

WHEN IT COMES TO STRETCHING,

TIMING IS EVERYTHING-

TAKEN FROM ACE FITNESS MATTERS VOLUME 11, ISSUE 3, MAY 2005, PAGE 5

Contrary to conventional wisdom, stretching prior to exercise may not be such a good idea after all. After an extensive review of the research on stretching, Dr. Ian Shrier of the Center for Clinical Epidemiology and Community Studies at SMBD-Jewish General Hospital in Montreal concluded that there is no clear evidence that stretching prior to exercise prevents injuries. In fact, in some instances, stretching immediately before activity may have a detrimental effect on performance because, Shrier explains, stretching causes a small, temporary reduction in a muscle's force and power.

Flexibility training performed regularly over time, however, may be more beneficial for improving performance. Like weight training, stretching increases both force and power when done regularly for several weeks. One study found that a consistent stretching regimen improved athletes' 50-yard dash speed by several hundredths of a second.

Despite the limited documented benefits, most experts, Shrier included, still recommend daily stretching, particularly to improve range of motion, following exercise. The key is to tailor the timing and duration of the stretching to the individual's needs and performance goals.

Source: The Physician and Sportsmedicine, 2005; 33, 3, 22-26





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THANK YOU, THANK YOU, THANK YOU!!!!



The staff and students at the HPL greatly appreciate the financial support so many of you have provided over the years. We are always so gratified to know that you believe in our work enough to personally invest in it. We thank the following people who made contributions to the Adult Fitness Program in 2005.



HPL Staff: (clockwise from top left),
John Seifert, Glenn Street, Dave
Bacharach, Barb Kunze.

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